ISyE 3770: Statistics & Applications

Instructor: Dr. Shijie Deng (deng@gatech.edu)
Course Prefix and Number: ISYE 3770 RCH
Term: Summer 2026
Classroom: **China Summer Program 2026**.

Course Information

Introduction to probability, probability distributions, point estimation, confidence intervals, hypothesis testing, linear regression, and analysis of variance.

Prerequisites:

MATH 2401 or MATH 2411 or MATH 2605, minimum grade of C. Or, working knowlodge of Calculus and linear algebra, including the ability to differentiate, integrate, and perform matrix inverstion.

Textbook:

Applied Statistics and Probability for Engineers, 6th/7th Edition, by Montgomery & Runger

Course Objective

The objective of this course is to introduce basic concepts and analytic models in probability and statistics, emphasizing applications in science and engineering. We will be covering materials contained in Chapters 2 through 13 in the text, and mostly in that order. We do not necessarily cover everything in the chapters, and it will be made clear which material is not covered during lectures.

Course Outcomes:

At the end of this course, we hope to help you build the following skills.

- Ability to collect, organize, summarize and present data graphically
- Demonstrate ability to use formal mathematical argument with basic probability concepts, including conditional probability distributions
- Understand how to characterize and assess probability in its role in experiments
- Use statistical tests and confidence intervals to assess mathematical uncertainty in statistical decisions
- Select proper statistical techniques for statistical decision making based on the type of data available
- Use statistical software to conduct data analyses and interpret output
- Draw sound statistical conclusions from experiments and observational studies

Software:

A statistical software, R, will be used in this class for lectures, assignments and projects. R is an open source software package wildly used in the academia and industry. It is free, flexible, and very powerful (download link: http://cran.r-project.org/). Employers appreciate the skills of competence in R.

Grading Policy:

Course grades will be based on assessment of students' understanding of the material covered thoughout the semester through course assignments and exams. Course assignments, tests and their respective weights in the course grade are as follows. Homework and tests are graded for correctness, with partial credit awarded for partial answers (e.g. work shown) or to account for minor errors.

Homework (30%): There will be a homeowrk assignment approximately every 1-2 weeks.
Quizzes (20%): 3-4 quizzes will be given throughout the semester.
Midterm (20%): in-class close-book close-note, 1:40pm – 3:50pm June 15 (Monday)
Final Exam (30%): Cumulative exam, in-class close-book close-note, 9am-11:50am July 27 (Monday)

Thresholds for letter grade assignment: A: 90%; B: 80%; C: 70%; D: 60%; F: <60%. The right to adjust the thresholds to avoid certain extreme cases is reserved.

Course Policy:

Participation is important in this class. Class attendance is mandatory and recorded by signing Attendance Sheet. Unexcused absences may affect your final grade. Up to three non-excused absences are allowed without questions asked. Interviews, family trips, meetings for other courses are not excused.

Working together on homework assignments is allowed, but your handed-in solutions should be personal and show individual effort (NOT identical to the others' assignments nor the previous solutions). For the regular assignments, the students need to submit their homework assignments on Canvas by the due date/time (usually 11PM). No late homework will be accepted. In addition, we ask students to type homework and exam reports with R Markdown or Latex. Make-up exams are not permitted except in cases of serious illness, Institute Approved absences, Dean's office recommended absences, or GT Athletic Association conflicts with appropriate documentations. All course materials and grades will be posted on Canvas. You are responsible to check if your posted grades are correct. You have three days from the day we return homework or tests on Canvas for considering re-grading. We reserve the right to re-grade the entire homework or exam. So keep in mind, you may lose more points than you gain when we re-grade your homework or exam. Please let us know any special situation you may have during the semester ASAP.

Academic Integrity

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. Review Georgia Tech's Honor Code and the student Code of Conduct. Any student suspected of cheating or plagiarism on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Student-Faculty Expectations Agreement

At Georgia Tech, we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. The Student-Faculty Expectations document (https://catalog.gatech.edu/rules/22/) articulates some basic expectations

that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek.

Accommodations for Students with Disabilities:

Georgia Tech provides upon request appropriate academic accommodations for students with disabilities. https://disabilityservices.gatech.edu/. If you are a student with learning needs that require special accommodation, contact the Office of Disability Services (404-894-2563) as soon as possible to discuss the needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

Core IMPACTS

Not applicable. (https://www.usg.edu/curriculum/core-impacts/ is the University System of Georgia's General Education curriculum.)

Collaboration, Group Work, and Use of Generative AI

You are allowed to work in groups on all homework and out-of-class assignments, but any work you turn in must be written in your own hand. In-class tests and exams are to be your own work. All in-class tests and exams will be closed-book and closed-notes.

In general, use of Generative AI as assistant for learning course materials is allowed. However, direct use of AI-generated solutions (without writing them in your own hand) and/or any previous semester course materials (such as homework solutions and project submissions) as submissions to course assignments are prohibited in this course. Using these materials will be considered a direct violation of academic policy and will be dealt with in accordance with the GT Academic Honor Code. When in doubt regarding what constitutes a violation, do not guess the answer and post on Piazza for clarifications.

Extensions, Late assignments, and Re-scheduled/missed exams

Late submission of assignments will not be accepted. No make-up assignments.